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THE PUBLIC CORPORATION: AN ADEQUATE INSTRUMENT FOR THE SUPPLY OF ELECTRIC POWER

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THE PUBLIC CORPORATION
AN ADEQUATE INSTRUMENT FOR THE SUPPLY OF ELECTRIC POWER

Latin America has undergone continued growth in its economic development since the end of World War II. The possibilities for further development are even more promising in the next ten years.

To face the hard task ahead each and every one of our countries must outline today their objectives and long term plans so as to provide the basic and essential elements required for such economic development. Electric power is one of the principal factors and in the planning for economic development it is indispensable to study ways to provide it in the required amounts, at low prices, and of the quality required.

A brief comparison between the per capita use of electricity in Latin American countries and in other countries at a higher economic level will show, first that there exists an intimate relationship between the degree of economic development of a country and the per capita use of electric power; and secondly, that a great effort is needed to provide more sources of electric energy.

The per capita consumption of electric energy taken from United Nations publications is as follows:

	Generation M-Kwh	Population (Thousands)	Per Capita Generation Kwh
Philippines	1,338	23,122	58
Colombia	1,535	13,522	114
Panamá	159	995	160
Cuba	1,484	6,466	230
Trinidad	194	789	246
Argentine	6,208	20,256	306
Chile	2,305	7,298	316
Venezuela	2,249	6,320	356
Puerto Rico	2,010	2,379	845
France	61,980	44,500	1,393
United States	740,576	174,231	4,251

Electric Service Characteristics:

Electric service has three important features which directly affect the economy of a nation, namely: quantity, quality and rates.

In the preparation of plans for the supply of electric power in a country undergoing an accelerated rate of growth first consideration must be given to the making of realistic forecasts of the quantities of

electric power demanded by such growth. The scarcity of electricity will retard the economic growth. Plans for electrical development should be long term and drafted very carefully as it takes from two to five years to install additional generating capacity. In order to provide adequate service such plans require constant efforts and should reflect the best judgment on the economic development of a community based on market studies and on the trends and programs which may bolster the economy. On the other hand, providing capacity in excess of the requirements may mean unnecessarily high investment affecting the operating costs to the point of making rate increases imperative.

The degree of quality of electric service needed in a country under economic development varies as the economy improves and the quality of service required should be made available at all times. The quality of the service is defined as the stability of its frequency and voltage, and its reliability. At the initial stages of economic development a city, town or village first uses electric service mainly for public lighting. The quality of this type of service does not require a high standard. It can operate on a low frequency, with high voltage regulation and permits service interruptions which do not affect the community. As the economy improves, families use electrical appliances in their homes; commercial freezers are employed and industrialization begins. Gradual and continuous improvement of the quality of the service becomes then imperative.

Electric power of a lower quality than required even though in abundance and at a low cost hinders the general improvement of the economy. Industry and commerce would become stagnant when not able to function satisfactorily due to the low quality of the energy provided. On the other hand, the cost of electricity varies according to its degree of quality. Offering a higher quality electric service than is required at a specific moment would imply high selling prices which in turn could retard the gradual growth of the community. Constant care and extreme good judgment should be thus always exercised to provide electric service of the quality required.

The most important factor in electric service is its selling price. The principal objective of every electric utility is to render the best possible service at the lowest possible cost compatible with the quality of service rendered and a sound financial policy. Rates that will cover the entire cost of service should be fixed. Excessive rates and below cost rates cannot be maintained specially in a country undergoing an accelerated economic growth.

Electric service requires a high capital investment. This is due to the fact that the product manufactured — electric energy— can not be stored. The electric utility must have available at all times the necessary facilities to produce and distribute the amount of energy demanded by the consumer for delivery at the required place and time.

It is also necessary to provide cold reserves and operating reserves in order to supply the demand.

Financing is a very important element of an electric utility since its capital requirements are higher than in other businesses. For an electric utility to render satisfactory service in a country whose economy is improving at an accelerated pace, it should rely on adequate long term financing to carry on additions and improvements to the system coordinated with the projected economic expansion.

The electric utility is characterized by high fixed operating expenses, the majority of which do not fluctuate under the influence of increases or decreases in consumption. In some utilities these fixed costs go as high as 80 per cent of the total operating costs. A decrease in the growth of electrical consumption results, therefore, in a reduction in revenue without a noticeable reduction in operating costs. In like manner, an increase in consumption can be taken care of with little additional cost which tends to reduce the unit cost of the service. Therefore, an electric enterprise in continuous growth is in a better position to operate under solid economic conditions and generally encounters economic difficulties when it ceases to grow or when its rate of increase begins to decline. Thus, an electric utility once it starts operations must continue its accelerated expansion in proportion to the economic improvement of the area it serves in order to be able

to render the best service at the lowest possible cost. To fulfill this requirement the electric utility must have the necessary financing. The increase in consumption reduces the unit cost of the service. It is, therefore, very important to establish promotional and educational programs to induce families and commercial customers to use more electricity. To sum up, the economy of an electric utility improves with the growth in consumption and every means should be exercised in order to increase the revenue and thus reduce the cost of the service.

Due to the special characteristics of the electric power service which require constant watch of the economic and technical factors, it is essential for electric utilities to have adequate personnel in the administrative as well as in the technical fields. Some of the functions which require continuous attention from experienced personnel are the revision of procedures, mechanization, improvements of the generating efficiency, continued attention to the preventive maintenance program, short and long term plans and projections, cost analyses and rate studies.

In so far as electric service is an indispensable public service on which a great portion of the economic development of a nation depends, the government should create regulatory bodies to coordinate the electrification program with the needs of the country, to establish

uniform standards for the electric service and to see that government established objectives such as quantity , quality and prices are observed.

Types of Electric Utilities:

In reviewing some of the characteristics of the electric service it becomes obvious that the selection of the type of enterprise to offer such a service depends on local factors which vary substantially from country to country and from time to time. Selection of the type of electric utility merits, therefore, a careful study of the local situation and the adaptation of the same to the characteristics of the service so as to make sure that the type of enterprise chosen for a locality totally fulfills the minimum requirements for satisfactory service.

No universal rules can be established giving preference to a specific type of electric utility. All types have their proper use and advantages according to local situations.

Electric service may be rendered by utilities owned by either foreign capital, local capital or a combination of both, by government agencies or by public corporations, usually referred to in the United States as governmental authorities.

Let us now examine how each one of these may be adapted to the local factors and to electric service characteristics.

The Private Corporation:

The private electric utility has flourished in the United States of America very satisfactorily and it has been partly responsible for the establishment and extension of electric service in Latin America.

There are very many large private corporations in the United States, Canada and other countries, engaged exclusively in the production, distribution and sale of electric energy in foreign countries. The fact that these corporations have grown and enjoyed a sound financial status during the many years of their operation rendering continuous service for a long time, proves the necessity for this type of electric utility.

Let us examine the characteristics and adaptability of the private corporation. Private corporations are created principally for commercial purposes. The stockholders invest their money in the corporation with the purpose of obtaining a reasonable profit. It is the duty of the board of directors of these corporations to invest in installations that will yield a reasonable profit on their investment

to the stockholders. We have to accept this fact and allow private business to earn a reasonable return on its investment for the rendering of service.

The private corporation, therefore, plays a dual role: it must function as a private enterprise with reasonable profits and it must at all moments render an indispensable public service at the lowest possible cost. In areas where these two unavoidable requirements can be fulfilled the private corporation can render a satisfactory service. When feasible the government is relieved from assuming the burden of a very complex administration.

To insure a clear understanding between the consumer and the private utility which may guarantee efficient service at reasonable costs and at the same time a reasonable profit to its stockholders, it is necessary that the government, which represents the people, create bodies to control and regulate the electric service.

These controlling agencies should possess ample power and should be given the necessary flexibility to grant electric service franchises, define the service area, limit the franchise, establish the policy to be followed in order to render the service, regulate the selling price and intervene when for some reason the franchise objective is not accomplished.

These agencies should be built around a nucleus of specialists. On many occasions there has been ill-feeling between the private corporation rendering electric service and the public, principally due to the technological weakness of the controlling agency.

In order to make clear its objective, the franchise should include specifically the rate of increase in consumption estimated by the government and the ability of the corporation to meet it, the quality of the service, the accounting system to be used by the corporation, the costs of operation allowed, such as replacements, depreciation, payment of interest, the reasonable percentage of profit permissible, the submittal of reports and the procedures for cost analyses and rate adjustments.

The private corporation pays taxes on its net revenues and on the value of its properties. These are proper expenses and in comparing the cost of the service with that rendered by government agencies the same basis for comparison should be used.

We believe that the publicly owned electric utility should contribute to the municipal, state and federal treasury in much the same manner as the private corporation in order to compensate for the taxes that would be paid by the utility, were it privately owned. In this way no disadvantage would accrue to the private corporation in connection with taxes as one of the costs of the service rendered.

The private corporation has to fix selling prices that will cover the total cost of the service plus a reasonable profit. The electric service rendered by the government should also have prices that will cover the total cost of the service.

In the case of electric service rendered by the government this must be rendered at cost, with no profit. The cost of the service, nevertheless, includes the cost of expansion of the system. On the other hand, a private corporation has the added expense of payment of dividends. The total cost of the service should be more or less the same for both in that respect.

The cost of money, that is, the financing cost of private enterprise, is much greater than that of a public enterprise. This is primarily due to the fact that the financial credit of the government is generally better than that of private business, and government bonds are tax free which reduces the interest on the loan. As indicated previously, the required investment in an electric service enterprise is very high, and the cost of the money constitutes a considerable portion of the total expenses. In this respect, the cost of the electric service rendered by a private enterprise is greater than that offered by government agencies to the advantage of public enterprise which, assuming the same operating efficiency, can sell its product at a lower cost.

The private corporation dedicated to the generation, distribution and sale of electric power has vast experience, adequate administrative and technical personnel and efficient operating practices. It would take years of experience for a government agency to equalize the efficiency of private enterprise. Political influence, government controls and public administration procedures are not the best for an electric service agency. These do not permit an accelerated development of either the personnel or the daily activities of the agency. To correct this deficiency the public utility has to hire a group of experienced technicians and administrators.

Experience shows that the private electric service corporation has been very successful in large cities and metropolitan areas but has not succeeded as well in areas made up of smaller cities, towns, villages and rural zones. This is due to the adaptability of the features of the electric service to private corporations. Cities such as New York, Florida, Río de Janeiro, Sao Paulo, Caracas, etc., are served satisfactorily by private undertakings. In cities of this type, the density of the load per kilometer of line built and average consumption per consumer are so high that operating and investment unit costs are relatively low. Under these conditions satisfactory service can be rendered at reasonable prices with a relatively low investment which guarantees at the same time a reasonable profit to the stockholders.

Notwithstanding this favorable environment for satisfactory operation it may happen that when a metropolitan area served by a private corporation expands rapidly, delays in the development of the long term plans of the corporation may occur due to lack of the necessary capital to expand the system in advance to meet the additional electrical demands.

In such cases, the electric system expansion takes place after the load demand occurs. A temporary shortage of electric power is created which tends to retard the development of the area in question. As previously stated, expansion plans should be prepared from three to five years in advance. When the system expansion is large, it requires large amounts of capital. In addition, it is customary to provide in advance enough generating capacity for two to three years of expansion in order to reduce costs and to simplify construction. It is frequently very difficult for a private enterprise to invest large sums of money on expansion based on plans of future economic growth. The private enterprise's primary obligation is to the stockholders. It would be unfair, on the other hand, to demand physical expansion of the electric system on the basis of such future programs.

Even when such a deficiency has been experienced by the private electric utility the problem has never been too critical in

large cities and it has always been satisfactorily solved. Cities served satisfactorily by private corporations are in fact a substantial help to the government which may thus channel its resources to other aspects of economic growth. It may be concluded that the private corporation may serve highly populated metropolitan areas at reasonable prices with good quality service and to the advantages of the government. Whether or not an electric service franchise should be granted to private enterprise to serve metropolitan areas while the government assumes the responsibility for underdeveloped areas, is something for individual analysis in each case.

The Governmental Agency for Electric Service:

Sometimes governments create special agencies to assume the responsibility for the supply of electric service attached, in some instances, to a government department. The government treasury provides the funds for their operation. Funds for expansion are obtained from special property taxes, annual legislative appropriations, or both. These agencies form an integral part of the public administration and, therefore, are governed by the regulations established for public bodies.

When the rate of economic growth is too high, the public agency finds itself incapable of providing adequately for the needed

expansion. Funds for expansion and improvement come from annual appropriations which are to a large extent. fixed. This hinders long term planning since the commitments for three, four or five years which are inherent in the electric power business cannot be made.

Fiscal appropriations for expansion, if they are to be taken care of by special legislation would be a heavy burden on the government's general annual budget. Even when the need is evident and the good will exists to make such appropriations it may become necessary to reduce them so as to take care of other important public needs.

In this type of electrical undertaking, the same as with private undertakings, the availability of capital is not directly geared to the need for expansion. Long term planning, essential in the electric service business, is thus substantially limited.

The revenues earned from electric energy sales by a public agency are covered into the public treasury and its operating budget is prepared for approval by the budget bureau with no consideration given to the relationship between revenues and expenses. This classical form of government operation separates the revenues from total operating expenses. As a result one may

lose sight of the relationship between selling price and the cost of the service. Inevitably when this happens, rates, in the long run, will not be representative of the total cost of the service and the electric service then would be really subsidized by the government.

We are convinced that an electric utility, private or public, must establish prices to cover the total cost of the service. Experience has shown that prices charged on this basis are reasonable if the enterprise is efficiently managed. Capital and operating expenses of an electric utility are so high that a perpetual subsidy would demand substantial funds from the public treasury, which may otherwise be used to attend to other important public services. Should this be the case, it is to be expected that the electric service would be deficient and that public funds to carry on the government programs would not be adequate. This disassociation of revenues from expenses may very well result in indifference towards the importance of limiting expenses in accordance with the revenues available. Thus, disappears the incentive for cost analysis, productivity and control measures. As a result, the unbalance between revenues and expenses may continue to grow progressively.

The public agency for electric service must comply with existing public administration regulations, Its purchases must, therefore, be made through the Government Purchasing Bureau. The way in which purchases of equipment and materials are made limits the necessary flexibility of the electric utility to develop in accordance with its needs.

Selection of personnel, recruitment, training, and salary administration, are done through and in accordance with Civil Service regulations.

The generation, distribution and sale of electric energy by the public agency is generally subject to great limitations. The public agency is better adapted to the management of electric distribution systems when wholesale power is available for delivery to the distribution network. This is due to the fact that generation and transmission require high investments, long term planning as well as technicians and more experienced managers, much more so than the distribution phase. Segregating these from the electric public agency widens the possibility of rendering a more satisfactory service in the phase of distribution.

The Public Electric Service Corporation:

The creation of the public electric service corporation was brought about by the need for attention by the government of certain

aspects of the electric power supply, due to the impossibility on the part of private corporations and to the limitations of the public agency to take care of this service. The public electric service corporation is a governmental body created by law to attend to the need for electric service. The law invests it with autonomy of operation and with the necessary flexibility, which do not exist in the management of public agencies, to render efficient service.

Of course, flexibility of operation of the public corporation depends entirely upon the provisions of the law creating it. In drafting a law to create a public electric service corporation each country should study the limitations existing in its public administration procedures that may affect the functioning of the corporation and should invest it with the necessary flexibility for proper operation.

Following are some of the provisions of law for a public corporation which allow the rendering of efficient service and tend to correct the limitations in the public agency.

(1) The principal objective in the creation of the public corporation is to render electric service to the com-

munity at the lowest possible cost consistent with a sound economic and financial policy. That should be, therefore, the mandate of the law.

(2) Power is granted to the corporation to finance its capital requirements through the sale of revenue bonds or any other practical way making it self-sufficient without burdening the government's fiscal budget.

(3) It must establish rates for the sale of electric power that are adequate to ensure that the selling price covers operating expenses and the payment of all contractual obligations.

(4) The public corporation is required to pay to the government each year enough money to compensate for the loss of tax revenue by the government equivalent more or less to the amount which would be paid by a private corporation as property taxes.

(5) The public corporation is granted authority to establish its own purchasing department. Generally, it makes its purchases following the same policies as any public agency, through public bids with awards

made to the lowest bidder after careful evaluation of all the elements and factors which affect the cost of the equipment, its quality and the business reputation of the bidder.

(6) It is also granted the power to establish its own procedures for the selection, recruitment and training of personnel and for salary administration.

(7) It is granted power to change or adjust its rates first holding public hearings and then obtaining the approval of its Governing Board without having to submit them to the public service commission or any other control agency.

A public electric service corporation endowed with powers similar to those just enumerated will then be in a position to render as efficient a service as a private corporation and at a similar cost or lower.

In countries with financial facilities the public corporation has full responsibility to finance the expansion and improvements to the electric system. Payment of interest and amortization of the debt is charged as an operating cost. This relieves

the operating budget of the government of a heavy burden. Otherwise, the government would have to make annual appropriations for expansion.

In the United States, including Puerto Rico, financing is done through the sale of revenue bonds in the open market. Once the private corporation establishes its financial reputation and maintains an adequate financial margin it can obtain all its financing through the sale of revenue bonds.

In other countries public corporations obtain part of their funds for expansion and improvement through loans from the economic development bank of the country in question.

In countries where, due to the accelerated rate of their economic growth, large amounts of money are required for the expansion of their electric systems, some public corporations get part of their funds from taxes on real property. With this income as a solid capital foundation the public corporation obtains the balance through loans from economic development banks, local banks and/or international banks.

The World Bank and the Export-Import Bank are at present the strongest sources of capital for the development and expansion of electric power in Latin America. The impression

exists that the important problem of adequate electric power supply would be solved through better understanding, more flexibility and more realism in the relationship between these banks and the public corporation. We hope that through the expected intensification, in the next ten years, of economic cooperation among the countries of the Americas, concepts will be clarified and financing methods which at present are hindering a greater development of electric power in Latin America because of financial limitations will be liberalized.

As we have seen, the public corporation enjoys much more flexibility and has access to more financing sources than the public agency. Of course, it must be pointed out that in order for the public corporation to be able to utilize any form of financing it must at all times give evidence of good management, of operating efficiency, technical ability, reasonable selling prices adjusted to insure recovery of the complete cost of the service including direct operating expenses, debt service, adequate classical reserve funds and other contractual obligations. The public agency has no means of evidencing these factors.

The public corporation can and should at all times operate efficiently and on a sound economic basis. The law,

generally, orders the public corporation to sell electric service at cost. Revenues from electric sales must then necessarily cover operating expenses and contractual obligations and, by law, the net should be insignificant. This manner of operation requires the most careful analysis at all times and makes good management imperative, as an oversight may result in a deficit. There exists as much incentive as in the private corporation for continuous and intense programs of simplification of procedures, mechanization, cost analysis and the establishment of measures and control. It also requires careful planning both for the expansion of the system and for the expansion of the organization. Experience shows that it is easier to provide for physical expansion than for adequate expansion of the administration as the most difficult task is that of recruitment and training of personnel. That is why the law creating the public corporation empowers it to administer its own recruitment and salary administration program.

Experienced administrative and technical personnel is often scarce in a country undergoing rapid economic development. The public corporation is not only able to train personnel adequately but is also able to import outside expert talent at attractive salaries thus availing itself of the necessary human resources for good management.

We can thus see that the public corporation can operate with the high efficiency typical of private industry as it has the necessary elements for an efficient operation.

On the other hand, the public corporation, as an integral part of the government, is obliged to adjust its plans for expansion to the country's economic rate of development and to the government programs. This is achieved through long and short term planning of the public corporation in which the required flexibility is provided to render the required services when needed. This is an advantage of the public corporation over the private corporation. The government can count in this way on a well-coordinated over-all plan to make sure that programs for social and economic improvement are taken care of.

Adequate planning is one of the most important phases of the public corporation. Marketing studies, industrialization programs and housing programs, both private and public, the addition of hotels, commercial establishments and office building construction programs together with trends and programs for future development should all be taken into consideration in forecasting consumption and revenues. The additional generating capacity needed, electric system improvements, the capital improvement program, the projection of total operating expenses, the economic sufficiency

of the rate structure, the capital required for expansion, financial requirements and the possible financing sources are an integral part of annual planning for a period of from five to six years.

Once the capital improvement program is approved, promptness should be applied to its development since it takes from three to five years to obtain additional generating capacity. In order to work out the development of the system according to plans, the public corporation handles its purchasing needs without intervention by the Government Purchasing Office.

The public corporation should be self-sufficient as to meeting its financing expenses as well as to the ways of obtaining the necessary capital for expansion and improvement. Proper functioning of the public corporation, in the long run, depends mainly on the existence of rates which actually cover the total cost of the service. Once this objective is achieved, the corporation's balance sheet would show a healthy position, the financial margin is thus increased and the expansion program is made less difficult.

Government subsidy through annual appropriations would be needed when electric power is supplied at prices below the cost of the service. This would be a heavy burden on the government's

fiscal budget and would limit considerably the sources of financing to the point where the government would be forced to appropriate more and more funds for capital construction. Thus the purpose of the corporation is defeated. This is the main reason why each country, each state, and each municipality must understand that the lowest possible price for the sale of electric power generated by a public corporation is at cost.

The governments of countries undergoing accelerated economic development face a number of problems which must be solved. The economy grows rapidly as the economic programs unfold.

The rural electrification problem is one of the most urgent and difficult to solve. The cost of investment per customer is so high and the consumption so low at the beginning that extension of rural electrification becomes, during its initial stage, a social program to be subsidized since it is not economically justifiable. In the United States of America, most probably the highest electrified country in the world, it was necessary to obtain financial help from the Federal Government to develop rural electrification. The Federal Rural Electrification Administration was created to grant loan payable in 33 years at 2 per cent interest. In Puerto Rico, whose economic level is below that of the United

States, but whose rate of economic growth is greater, much attention is given to the rural electrification program. We were able to solve the problem only when the Puerto Rico Water Resources Authority was created as a public corporation in 1941. The Federal Rural Electrification Administration finances the Authority's rural electrification through loans made to the Authority. The low cost of the money available for the expansion of the system was not enough to cover the cost of the service and the government of the Commonwealth contributes, additionally, each year the necessary funds to make this type of service economically feasible. Already 80 per cent of the population of Puerto Rico has electricity in spite of the fact that more than 50 per cent of the population is rural.

This shows how the public corporation, without losing its efficiency of operation, may contribute to the development of a country undergoing an accelerated economic growth, by cooperating with the government without burdening the national budget.

Puerto Rico Water Resources Authority:

Let us review briefly the historical development of electric power in Puerto Rico inasmuch as in this small island have been tried all the forms of electric undertaking and also Puerto Rico in undergoing an economic development similar to

that in other Latin American countries.

The Government of Puerto Rico began to render electric service in 1915 when a small hydroelectric plant was built as part of the Irrigation System of the South Coast. The purpose of this plant was to provide electric energy for the use of irrigation water pumps since there was no electric service in the zone at that time.

The excess electric energy generated was distributed for sale in the neighboring towns. Small additional power plants were built using the hydro potential of the irrigation reservoirs. The consumption of electricity continued to increase as a by-product of the irrigation system. The demand for electric system in the South Coast of Puerto Rico made the government recognize the necessity of this service not as a by-product but as a basic service.

The poverty of the area, the spread-out population and limited use of electricity by each customer clearly indicated that private industry could not exploit the possibilities.

In 1927 a new body known as Utilization of the Water Resources was created by law as a public agency in the Department of Public Works. This agency was created with the sole purpose

of developing the hydroelectric resources for the generation, distribution and sale of electric power. A tax of 1/10 of 1 per cent on the assessed valuation of real property was levied for the purpose of expanding the electric system. The use of electric service grew rapidly since it was rendered at low prices and of good quality.

Almost every municipality in the South Coast sold its electric system to Utilization of the Water Resources. This agency had better technicians, capital available for expansion, offered lower rates and, in addition, the agency paid to the municipalities 6 per cent of the gross revenue obtained within each municipality to compensate for the taxes which the municipality would have otherwise obtained from the electric system had it been private.

By 1940 nearly all of the urban areas and a great portion of the rural zone in southeast Puerto Rico were served by Utilization of the Water Resources. The northern area of Puerto Rico was at the time served by a private corporation owned by foreign capital and the western coast by a locally owned private corporation.

The private corporations rendered satisfactory service at low rates and of high quality in the urgan areas within

their territories. Of course, they were not able to extend the electric network to the rural zone.

During World War II the supply of electric energy reached a critical stage in the territories of the private companies due to the scarcity of fuel oil for the thermal plants. The oil supply was from off-shore. The Federal Government then took them over and integrated them into the hydroelectric system of Utilization of the Water Resources. A year later the private companies sold out to the Government of Puerto Rico thus completing the integration of the electric system.

In 1941 the Government of Puerto Rico saw the necessity for creating a new entity which could handle the generation distribution and sale of electric energy in Puerto Rico. This body would be in charge of developing rural electrification and of providing electric energy in the quantities and of the quality needed to promote the industrial and economic development planned by the Commonwealth government. The Puerto Rico Water Resources Authority was created for this purpose. It is a public corporation, quasi autonomous which has been dedicated to the rendering of electric service for the last twenty years.

It is administered by a Governing Board made up of the Governor of Puerto Rico as Chairman, the Secretary of Public

Works and the Secretary of Agriculture. The Governing Board appoints the Executive Director, who in turn appoints all other officers, and directs and manages the Authority following the policy established by the Governing Board.

The law provides that the Authority has the power of formulating its own rules and regulations concerning the recruitment, training and selection of personnel and to establish its own salary scales. This has allowed the employment of technicians and administrators who would have been very difficult to acquire through the Civil Service.

The law allows the Authority to buy directly under public bidding procedures without the intervention of the Government Purchasing Office. This saves time and guarantees a better selection of the equipment.

The law requires the Authority to render electric service at the lowest possible cost compatible with a sound economic and financial policy and to fix the rates in such a way as to cover the total cost of the service. The Executive Director can request a change in rates to the Governing Board which in turn appoints an examiner to preside at public hearings in which the change in rates is considered.

The required financing for expansion and improvements to the system is carried out by means of the sale of revenue bonds in the United States bond market.

The Puerto Rico Water Resources Authority since its beginning adopted a program of expansion coupled to the rate of economic growth in the Island and to the government's industrial development program. Since then, no industry or business has experienced a lack of electric energy. As was to be expected, with the coordination of all these economic programs, the economy of the Island has continuously improved at an accelerated rate and the consumption of electric energy increases 18 per cent annually, which requires doubling the capacity of the system every five years.

The Authority owns a generating system with a dependable capacity of approximately 600,000 kilowatts of which 100,000 are hydroelectric and 500,000 thermoelectric. The generating system is integrated in a solid transmission network which extends throughout the Island and is made up of 1,200 miles of 38,000 and 115,000 volt lines. Approximately 250 distribution substations fed by the transmission network transform the available energy into 4,160 volts to be distributed through distribution lines to more than 400,000 customers.

The Authority sells 1,500,000 kilowatthours annually with revenues of $44 million a year, or a continuous increase of 15 per cent annually. Twenty thousand additional customers, in round figures, are being served each year. At present the total debt amounts to $234,000,000. The electric system is valued at $258,380,000 with $44,500,000 of construction work in progress. The rate of growth is such that during the last two years the annual expansion program increased to $40 million. It is expected that it will gradually become stabilized at $30 million a year. The electric rates have remained essentially unaltered since 1940 in spite of the high increase in the cost of living, and in salaries and cost of materials. Electric rates in Puerto Rico compare favorably with the prices along the East Coast of the United States, where the cost of fuel oil is similar to that in Puerto Rico.

From total revenues of $40 million received in fiscal year 1959-60 the net surplus after deducting operating expenses, depreciation, debt cost and other contractual obligations, amounted to $946,000. This shows how the Authority has been able to sell at cost as provided by law, and has taken the necessary care to operate normally without a deficit which is in itself equivalent to operating with a high degree of efficiency.

Summarizing, Puerto Rico has experienced since the year 1941 a continuous accelerated economic growth. During that period we have passed from a totally agricultural economy to a basically industrial economy. The Puerto Rico Water Resources Authority during the last twenty years has provided the necessary generating capacity and expansion of the electric system to supply electric power in the needed quantities, of good quality and at reasonable prices.

We firmly believe, that due to the characteristics of the electric service and to the limitations in other methods of providing it, neither the private corporation nor the public agency would have been able to fulfill this difficult task, and the Authority has been the springboard toward an economic improvement which at present is one of those in more rapid development in the world.